CHAPTER THREE
ACTION PLAN TOPICS: SOURCE CONTROLS

POINT SOURCE POLLUTION

Point source pollution originates from a single defined source such as municipal or industrial wastewater treatment discharges. Under new EPA regulations, storm water discharges will also be regulated as point sources. However, regulation of storm water discharges is discussed more fully under nonpoint source pollution section because nonpoint source pollutants constitute such a large portion of storm water.

Over half of the permitted wastewater discharges in Texas have a final destination in Galveston Bay. Thus a review of water quality control legislation and programs is of special importance for the bay. Some 485 industrial and 617 domestic sources are permitted to discharge into the bay and immediately adjacent bodies of water, a permitted total of more than 750 million gallons per day (Texas Water Commission, 1990).

The Dual Permitting System

Point source pollution is regulated by a combination of state and federal laws. Point source discharges into water bodies in Texas must be permitted pursuant to Section 301 of the **Clean Water Act** and Section 26.121 of the Texas Water Code. Currently, permits for discharges are required from both the federal **Environmental Protection Agency** (EPA) and the **Texas Water Commission** (TWC) (or, in the case of dishcarges from oil and gas facilities, the **Texas Railroad Commission**, or TRC) because the federal National Pollution Discharge Elimination System (NPDES) program has not yet been delegated to Texas.

TWC has been pursuing delegation of the NPDES program since early in 1990. In order for a state to be delegated the NPDES program, it must meet certain federal guidelines, both for the program itself and for related administrative and legal arrangements. In February 1991, the **Office of the Texas Attorney General** informed TWC that it had found two deficient areas in state law that would prevent federal delegation (Lynch letter, February 20, 1991):

1) Citizen Participation in State Enforcement. The federal Clean Water Act establishes a policy of encouraging citizen participation in enforcement. If the federal program is to be delegated, therefore, either citizens must be allowed under state law to intervene in civil and administrative actions, or the implementing agency must provide at least 30 days for citizen comment on proposed settlements of state enforcement actions and must make certain assurances that it will allow and encourage citizen participation. The Attorney General's Office found that Texas law does not meet these criteria.

2) Conflict of Interest Provision. Federal law requires that no one serving on the permitting body, in this case the Texas Water Commission, may have received a significant portion of his or her income from permitholders or applicants in the previous two years. Texas law has no such restrictions, only preventing Commissioners from having a spouse employed by regulated entities or from owning or controlling more than a ten percent interest in a regulated entity. On January 15, 1991, just before leaving office, Governor Bill Clements signed Executive Order WPC-90-12 which essentially meets the requirements of the federal law. However, because executive orders are neither laws nor regulations and because state law does not seem to grant executives authority to impose such conditions, the Attorney General's Office believes that the executive order would not meet the federal requirements.

A third area of concern for the AG's Office is the state Open Records Act, which may or may not meet the federal requirements. In addition to these concerns, environmental groups have identified other areas where they believe that state law does not meet minimum federal guidelines for NPDES delegation. They include lack of a state requirement for an Environmental Impact Statement process; low level of penalties assessed under state law; and TWC's lack of ability to enter facilities for enforcement and to regulate federal discharges. These groups are concerned more generally about what they perceive as TWC's use of engineering judgment rather than effluent standards in granting permits, and they prefer the dual permitting system which allows them two chances to affect the decisionmaking process. In contrast, regulated entities feel that the dual permitting process is burdensome.

The dual permitting process is coordinated to some degree as TWC drafts a large percentage of the NPDES permits for the EPA. These draft permits, however, are not always utilized by the EPA. EPA is not compelled to follow TWC rules nor to use TWC calculations. If permits issued by the two agencies for the same facility contain different restrictive parameters, the more restrictive permit governs.

Permitting by State Agencies

The Texas Water Commission is responsible for promulgating the State of Texas Surface Water Quality Standards which contain general and numerical criteria for each classified stream segment in the state. These standards must be revised every three years and are subject to EPA approval and a public hearing process. General use criteria are descriptive in nature. For example Upper Galveston Bay (segment 2421) and Lower Galveston Bay (segment 2439) have the following "designated uses": contact recreation, high quality aquatic life habitat, and shellfish waters. Criteria to protect these designated uses include a dissolved oxygen criterion of 4.0 mg/L and a fecal coliform criterion of 14/100 mL (30 day geometric mean not to be exceeded). NPDES and state discharge permits are required to be protective of applicable instream water quality standards. As noted, state discharge permits are issued by the TWC or the RRC. The permit application is subject to an open hearing process.

Most of the data used for monitoring discharges is self-reported by the permit holders on a monthly basis (the frequency of sampling required in the monthly report depends on the capacity of the plant). TWC also maintains several hundred additional monitoring stations state-wide that obtain data used for both ambient conditons and permit monitoring. Periodic wasteload evaluations are performed at selected sites to determine the approximate distribution of loading of point, nonpoint, and "natural" pollutants (BOD); these evaluations are similar to the Total Maximum Daily Loads (TMDL's) required by Section 303 (d) of the federal Clean Water Act. Compliance inspections are conducted according to a schedule determined by the potential impacts of the discharge and the results of previous compliance inspections. Mandatory compliance hearings are conducted for those permit holders whose self-reporting data indicate substantial noncompliance for four consecutive months. Enforcement options for noncompliance include warning letters, corrective orders, administrative penalties, and referral to the Attorney General for civil penalties.

The **Texas Railroad Commission** (RRC) has jurisdiction over the disposal of wastes into or adjacent to the waters of the state from activities associated with the exploration, development, and production of oil, gas, and geothermal resources. As with other facilities, oil and gas facilities must obtain discharge permits from both the EPA and the RRC until delegation of the NPDES program to the RRC. The RRC has adopted Statewide Rule 77 (16 TAC 3.75) which will become effective upon NPDES delegation and is more comprehensive than regulations presently in place. Currently, waste discharges are regulated under Statewide Rule 8 (16 TAC 3.8) which expressly prohibits polluting offshore and estuarine zones. Furthermore, Section 26.131(b) of the Texas Water Code prohibits the RRC from issuing permits that will violate state water quality standards. Dischargers are required to sample monthly, and submit quarterly monitoring reports to the RRC's District 3 Office in Houston. Annual on-site inspections are also conducted to detect possible permit violations.

Senate Bill 1103, passed in the 72nd Texas Legislature (1991), provides the RRC an additional tool to combat pollution from abandoned wells. A fund with a $6 million floor and a $10 million dollar ceiling will be established for the purpose of plugging such wells throughout the state. The fund will be created through the collection of fees and penalties, and will be utilized to plug abandoned wells and cleaning up both surface and underground wastes which are causing or likely to cause water pollution. Approximately 7,000 wells in need of plugging have already been identified as possible environmental threats, and it is estimated that between 40,000 and 50,000 wells are producing less than three barrels a day (*Austin American Statesman*, May 29, 1991). It is likely that many of these wells will require plugging in the near future, and money from this new fund will aid in reducing pollution associated with abandoned wells. The fund, originally called the "Well-Plugging Fund," was renamed the "Oil Field Cleanup Fund" in the legislation as passed in order to emphasize the equal importance of surface cleanup.

Municipal Wastewater Treatment

Municipal water treatment plants (POTWs, or publicly owned treatment works) are subject to the same water treatment standards as other dischargers. In order to assist them in meeting these standards, industries that dischange into municipal wastewater treatment systems must pretreat their own wastes under the National Pretreatment Program, established in 1981. Municipalities are responsible for enforcing regulations under the pretreatment program, which incorporates general standards preventing anyone from releasing pollutants that might interfere with the treatment process or create a hazard as well as specific standards for 26 industries.

Municipalities with populations greater than 5000 people must comply with the Municipal Water Pollution Control and Abatement Program, regulations for which were developed by TWC. The program requires municipalities to maintain an inventory of all significant waste discharges to the water within the city and, optionally, the extraterritorial jurisdication; to monitor significant waste discharges; to inspect and test these discharges; and to work with TWC to obtain compliance. The Gulf Coast Waste Disposal Authority, a regional authority, operates eleven municipal wastewater treatment plants and seven water treatment plants serving approximately twenty-four districts and cities. Five of these are large, regional facilities. The Authority also owns and operates three industrial wastewater treatment facilities handling liquid waste from over forty-five plants.

The increased standards have placed burdens on localities to construct and maintain high quality wastewater facilities. The Texas Water Development Board, which oversees water supply and water financing, provides up to 55 percent of funds needed for certain components of public wastewater collection and treatment facilities. Under the 1987 amendments to the federal Clean Water Act, this grant program will be gradually converted to a revolving loan program. Municipalities obtain low-interest loans, repayment of which is used to sponsor new projects. The Water Development Fund, a similar revolving fund, emphasizes regional wastewater treatment programs, and can also be used for regional water facilities and projects intended to convert from ground water to surface water.

Even from this brief description it is possible to identify some potential problems with the regulatory framework for point source pollution. For example, TWC cannot review discharge permits issued by the RRC. Thus no single entity necessarily reviews all the discharges into any body of water. Even in cases where a single agency does review all the permits affecting a body of water, enforcement emphasizes compliance with a single permit rather than evaluating the cumulative impact of the permitted discharges on the receiving waters. For toxic substances, which are often difficult to detect and may have effects at extremely low levels, this problem is especially severe. However, both EPA and TWC are adopting a watershed approach to water quality that may alleviate this problem when implemented. Similarly, tidal disposal activities permitted by the RRC may adversely impact aquatic life due to their high salinity, but RRC permits are not required to consider this parameter. Other problems include those raised by the Attorney General's Office (and

additional problems identified by environmental groups) as preventing NPDES delegation. Finally, ever-worse financial stringency may affect the abilities of local governments to fulfill their obligations for waste treatment and monitoring of water quality.

NON-POINT SOURCE POLLUTION

Nonpoint source pollution (NPS) is associated with agriculture, silviculture and urban runoff as well as leaks from septic tanks and waste disposal sites. Such pollution does not emanate from a single location, and therefore it is harder to control and regulate than point source discharges. Yet, as point source municipal and industrial pollution is further reduced, nonpoint source pollution plays a relatively larger role in the degradation of the nation's waters. Although storm water discharges are defined as point source discharges under the provisions of the federal **Water Quality Act**, NPS pollutants constitute a major portion of the pollutants in such discharges. Storm water regulations, therefore, are analyzed in this section rather than in the section on point sources. Conversely, two other sources of nonpoint pollution–dredging and disposal of dredged material, and spills of oil and hazardous materials–are treated in the respective sections on those two activities.

Section 405 of the **WQA** establishes a new management structure for permitting storm water discharges through the addition of Section 402(p) to the **Clean Water Act**. With the exception of storm water from industrial activities, most storm water discharges were exempted from **EPA**'s first storm water regulations issued in 1973. EPA's attempts to formulate a comprehensive storm water regulatory program were unsuccessful in the 1970s, and the WQA imposed new deadlines for the regulatory program. Deadlines requiring regulations for storm water discharges for industry and cities were established in the following order: industries and municipal separate storm sewer serving populations over 250,000; municipal separate storm sewers serving populations between 250,000 and 100,000; and municipal separate storm sewers serving populations under 100,000.

The provisions mandated under Section 402(p)(3)(A) of the CWA require that industrial dischargers meet the applicable provisions of Sections 301 and 402 of the CWA (which includes requirements to use both Best Available Technology –BAT–and Best Conventional Pollutant Control Technology–BCT–pollution control technology and the use of water-quality based controls where necessary). Section 402(p)(3)(B) of the CWA dictates requirements to be included in NPDES permits for municipal storm sewers. Permits for muncipal systems may be issued on a system or jurisdiction-wide basis, must include a requirement to prevent non-storm sewer discharges into the storm sewers, and must require methods of control which eliminate the discharge of pollutants to the maximum extent practicable.

Section 401 of the WQA amends section 402(1)(2) of the CWA by stipulating that a storm water permit will not be required for runoff from mining and from oil and gas exploration, production, treatment, or transmission if the discharge does not come into contact with any raw material, product, byproduct, or waste product located on the site. Section 503 of the

WQA amends Section 502(14) of the CWA by excluding agricultural storm water discharges from the definition of a point source, thereby excluding such discharges from permit requirements (55 FR, 1990, pp.47992-47994). These excluded categories obviously contribute to nonpoint source pollution, but are exempt from storm water regulations. The storm water requirements of the WQA, however, were not the only provisions of the act aimed at reducing nonpoint source pollution.

Section 319 of the Water Quality Act requires states to identify and assess water bodies affected by NPS pollution and to develop programs to control NPS pollution. These programs are to include Best Management Practices (BMPs) which will reduce NPS pollution. The Texas Water Commission, which is primarily responsible for nonpoint source pollution control in Texas, has submitted the *1990 Update to the Nonpoint Source Water Pollution Management Report for the State of Texas* as a response to this mandate, and parts of it have been approved by the EPA.

EPA approval of the plans is required before the state can receive federal grants which could cover as much as 60 percent of the implementation costs of the nonpoint source pollution reduction plans. Although $400 million has been authorized for the federal program from 1988-1991, the $38.6 million appropriation in Fiscal Year 1990 marked the first appropriation for the program. An additional $50 million has been appropriated for FY 1991. President Bush's FY1992 budget request amounts to $23 million for the Section 319 grants (Copeland, June 12, 1991, p.6). It is likely, therefore, that only one-fourth of the authorized funds will be appropriated for the nonpoint source reduction program.

Indeed, it is possible that Section 319 may follow the fate of Section 208 of the CWA. Section 208 required the development of area-wide waste treatment plans by the states, but no federal implementation money was authorized and few plans developed were ever implemented (Copeland, June 12, 1991, p.7). Some observers fear that the Section 319 NPS program will be delegated entirely to the states without any federal funding as part of the reauthorization process of the CWA (Beckett Interview).

Section 26.177 of the Texas Water Code provides an additional framework for NPS pollution control by requiring cities having populations of 5,000 or more to establish pollution control and abatement programs. Under this section, plans must be established and implemented "for controlling and abating pollution or potential pollution resulting from generalized discharges of waste which are not traceable to a specific source, such as storm sewer discharges and urban runoff from rain water." This program resembles a similar program authorized in the early 1970s which was never fully implemented due to a lack of funding and a lack of an effective enforcement mechanism. In the Galveston Bay area, local drainage districts along with county and city authorities are responsible for maintaining storm drainage systems.

In 1989, TWC was given review authority over city programs and the authority to adopt rules for the establishment of the program. Moreover, TWC may assess fees to recover the costs

of administering the program. The rules initially proposed were not well received by the cities, and the agency is presently working on revisions to be published in summer 1991. TWC is also taking measures to ensure that provisions of the program will be consistent with the federal permit requirements for storm water systems (which are treated as point sources under the NPDES permit program). The program requires cities to inventory and monitor wastes being discharged into or adjacent to waters in the city, in addition to the required formulation and execution of plans to control nonpoint source pollution.

In addition to stormwater runoff, sources of NPS pollution in Galveston Bay include agricultural runoff, soil erosion, leaks from septic tanks and landfills, and airborne contaminants that enter the water. Agricultural runoff is controlled in different ways: through EPA-approved labels on pesticides that include instructions for use that are intended to minimize runoff, and through the programs of several agriculture-related agencies to teach farmers ways to minimize runoff. The success of labeling depends not only upon the farmers' willingness to follow the instructions exactly but also upon the extent to which the instructions are related to actual conditions of use. Rice growing, an important agricultural activity in areas near Galveston Bay, usually entails use of standing water, with the result that any pesticide application could occasion some runoff into waters flowing into the bay. Mosquito abatement, which occurs during the spring and summer when juvenile fish and shellfish enter the marshes, also causes pesticide runoff into Galveston Bay. Mosquito control is usually carried out by local health departments. Finally, urban pesticide use for purposes including both insect control and lawn enhancement creates considerable potential for runoff into Galveston Bay.

Soil erosion is another source of possible pollution, both from the soil itself and from any contaminants, including pesticides, it may contain. The 1935 Soil and Water Act created the Soil Conservation Service, which was authorized to provide technical assistance for soil conservation. By 1947, every state, including Texas, had passed soil conservation district enabling legislation which allowed districts to be established and gave them power to develop conservation plans and provide some assistance to private landowners.

The **United States Department of Agriculture** (USDA), through the Soil Conservation Service (SCS) and the Agricultural Stabilization and Conservation Service (ASCS), offers farmers grants and training in best management practices (BMPs) for reducing runoff. The SCS studies soil, water, and vegetation characteristics and compiles techniical guides that describe BMPs for controlling runoff and reducing erosion under local conditions. SCS specialists also provide on-site technical assistance to individual farmers in planning and applying BMPs. The ASCS provides small cost-share grants to individual farmers for installation of BMP capital improvements. In addition, the Texas Agricultural Extension Service works directly with farmers on agricultural soil management, land use, and proper pesticide use.

Septic tanks are regulated by the **Texas Department of Health**, which has promulgated construction standards designed to insure that the tanks do not leak. People who want to

build septic tanks must obtain a permit from the local TDH field office, except in areas where TDH has delegated authority to "local authorized agents" to oversee standards that may be more stringent than those promulgated by the state. All five of the bay-area counties' health departments are local authorized agents. Although leaks from septic tanks frequently affect groundwater, they may also affect surface water in two ways: when the water table is shallow and when systems fail, creating runoff. Given the age of many of the septic tanks in the Galveston Bay area and the frequency and intensity of rainstorms, septic tanks do create a possible nonpoint source of pollution for bay waters.

Landfills containing hazardous or nonhazardous waste, leaks from which usually affect groundwater, may also create surface runoff. The Bureau of Solid Waste Management in TDH has regulatory oversight of all aspects of non-hazardous municipal solid waste. Municipal waste facilities must be permitted by TDH. The permits are generally valid for the life of the site. TDH is responsible for periodic monitoring of disposal sites to ensure compliance with department standards. The standards include surface drainage controls to minimize drainage problems, requirements to protect against a 100-year flood, and protective measures to ensure that a facility will not harm endangered or threatened species, as well as provisions to prevent groundwater contamination through soil liners and monitoring programs. The department tries to inspect sites serving more than 5,000 people at least once every three months and smaller sites annually. TDH may take enforcement measures which include notification letters of noncompliance, permit revocation, administrative penalties, and referral to the Texas Attorney General. Under a law passed in the special session of the Texas legislature in summer 1991, the Solid Waste Division of the Texas Department of Health will be incorporated into the Texas Water Commission in March, 1992 and its responsibilities will pass to the new Natural Resource Conservation Commission when it is created in 1993.

Hazardous waste ranks very high on the list of public concerns for both the environment and human health. It is handled in four different ways: disposal in landfills, disposal in injection wells, incineration, and treatment. Land disposal including injection wells is the most commonly used practice and the one of primary concern for Galveston Bay to the extent that it creates surface runoff. However, it does not usually constitute the most serious health risk faced even by people living near abandoned waste sites.

Hazardous waste is regulated under the Resource Conservation and Recovery Act (**RCRA**), the Hazardous Solid Waste Amendments (**HSWA**), the Safe Drinking Water Act (**SDWA**), and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). RCRA regulates waste currently generated to ensure correct handling and disposal, treatment or storage. The HSWA, the reauthorization legislation for RCRA, imposed a ban on landfill disposal of specified wastes, emphasized minimization and treatment techniques to reduce the volume and toxicity of hazardous wastes, and established strict Minimum Technical Requirements for all landfills including new landfills and ones already in use (Texas House, Task Force, pp. 48-49).

The **Texas Water Commission** is in charge of hazardous waste programs, which are funded by federal grants and through fees paid by generators and facilities. In order to operate, all waste storage, treatment, and disposal facilities must have a TWC permit, issued by the Hazardous and Solid Waste Division, that includes provisions for design, construction, operation, emergency procedures, monitoring, closure activities, and financial responsibility.

Enforcement of both federal and state laws is accomplished by inspections scheduled through the TWC central office and performed by district office personnel. Land disposal facilities are inspected about once a year. Inspections are performed according to the following priorities: state regulations, emphasis on groundwater protection, compliance with permit and closure plans, overseeing corrective action, and enforcing HSWA regulations, particularly land disposal requirements (State Auditor, Feb. 1990, p.20). TWC has several enforcement tools including civil penalties, criminal fines, injunctive relief from the Attorney General's Office, emergency orders and administrative penalties (Department of Agriculture, p.15).

Many different substances may enter the waters of Galveston Bay after being emitted to and carried in the air. Air emissions are regulated by the **Texas Air Control Board**. Although there is some potential for airborne toxics to enter the water and bioaccumulate, the extent of this problem is difficult to measure. New information about the nature and quantity of air emissions of many toxics is now available under **EPCRA (SARA Title III)**.

Again, even this brief review suggests areas of potential difficulty. Storm water discharges from oil, gas, and agricultural activities are expressly exempted from permitting requirements under the Water Quality Act amendments to the Clean Water Act. Federal funding for the NPS pollution provisions of Section 319 of the WQA has been far below authorized levels and may decline to nothing if the reauthorization of the Clean Water Act includes full delegation of the program to the states. There is a possible overlap in authority between the NPS pollution requirements of the WQA and the state pollution abatement requirements for cities with populations over 5,000. The complexities of regulated hazardous and nonhazardous waste disposal sites, the uncertainties regarding the effects of air pollution on bay waters, and the difficulties of regulating thousands of old, scattered septic tanks compound the problems in controlling nonpoint sources.

SPILLS/DUMPING

With four major ports and hundreds of major petrochemical and steel companies on its shores, Galveston Bay supports a great amount of ship traffic. These ships and barges may accidentally spill some of their loads; in addition, they must pump out sewage and water used in cleaning the hold between shipments. Land-based facilities may also experience accidents that cause untreated effluent to reach the waters of the bay or feeding streams.

In 1990, the Apex barge spill in Galveston Bay resulted in a discharge of over 700,000 gallons of petroleum.

The mechanisms for managing spills are quite complicated because of the number of agencies involved and the fact that oil, hazardous materials, and other materials are treated differently. Chapter 26, subchapter G of the **Texas Water Code** designates the Texas Water Commission as the lead agency for spill response and cleanup and for implementing the state's policy to prevent spills and discharges of hazardous substances. TWC also implements "Superfund" activities under the federal **CERCLA** and **SARA** and serves as Texas' primary representative to the federal Regional Response Team (RRT). However, spills of oil in coastal waters are the responsibility of the **General Land Office**, while the **Railroad Commission** retains sole responsibility for regulating small coastal discharges and all other activities relating to oil and gas exploration or production that might affect surface or ground waters. "Major upsets" or spills into air are primarily the responsibility of the **Air Control Board**. In addition, a new federal law, the **Oil Pollution Act of 1990**, requires tank vessels and on-shore facilities to develop oil spill response plans and requires tankers eventually to be converted to double hull construction. Finally, two federal agencies, **EPA** and the **Coast Guard**, ensure that responsible parties undertake cleanup and assist when necessary.

The first step in spill response is that the responsible party must report the spill to the federal National Response Center and to the Water Commission (or, in the case of oil spills, the Railroad Commission). The state maintains an Emergency Response Center which may be notified instead and is open 24 hours a day. Responsible parties may also need to notify local authorities.

The party responsible for the spill is also responsible for its containment and cleanup. Many fixed facilities have emergency response teams specially trained for the hazards that might arise from substances used at that particular facility. If they require assistance, the spill goes off the site, or if agency personnel determine that response is inadequate, the responsible agencies intervene.

The Governor's Division of Emergency Management (DEM), which helps coordinate response to natural disasters such as tornadoes as well as man-made spills and which is headed by the Director of the **Department of Public Safety**, may call together teams including representatives from a wide range of state agencies and the Red Cross, depending upon the nature of the emergency. This Emergency Management Council is the coordinating body if a disaster is declared under the Texas Disaster Act of 1975.

First, a local on-scene coordinator is designated. Many localities in Texas have received money from DEM to develop comprehensive emergency response plans; these plans include a method for determining the on-scene coordinator. He reports to TWC, whose agent arrives and provides technical assistance and, as appropriate, mobilizes state emergency response resources. Other state agency representatives also assist if their agencies have relevant duties. If the accident is big enough, federal response agencies may also become involved. Coordination authority moves to representatives from higher level agencies if the response is inadequate or assistance is requested.

Oil spill response was coordinated by the Texas Water Commission, working with the Coast Guard. However, in 1991, the Texas Legislature passed the Oil Spill Prevention and Response Act, which designated the General Land Office as the lead agency for initiating response to actual or threatened unauthorized discharges of oil. GLO is to develop a coastal discharge contingency plan, with the other agencies contributing portions according to their authorities, differing according to the environmental conditions of the different areas along the coast. GLO is now the agency that receives notification of oil spills and is responsible for on-scene coordination.

The most effective spill response is spill prevention. Many of the requirements discussed under point and non-point source pollution above are intended to prevent spills. Once a spill has occurred, adverse effects are minimized by speed and accuracy in response. Because so many different agencies have some authority for spill response, they have worked together to develop Memoranda of Understanding and other mechanisms to ensure coordination. The designation of a single on-scene coordinator and recognition by all participants of the coordinator's authority is one of the most important means for ensuring an efficient response. Oil spills, which are of particular concern in Galveston Bay, may be reduced once the full effect of the 1990 federal Oil Pollution law is felt, but this will not occur until after 1995. New data on the effects of oil spills on wildlife and wetlands, and especially upon young shrimp, will soon be available as a result of a study funded by Apex, owners of the barges involved in the July 1990 Galveston Bay oil spill.

Marine Debris

Marine debris is the term used to describe trash and non-chemical objects that are dumped into the ocean. Animals may ingest or become entangled in the debris that is accumulating in the water and along the coast.

The problem results from the routine dumping of waste overboard into the water by marine vessels. It is estimated that the world's merchant shipping fleet dumps at least 4,800,000 metal, 300,000 glass and 450,000 plastic containers into the sea every day. Direct ocean dumping of debris from land-based sources, litter from visitors, and indirect sources, such as rivers, run-off, and municipal and industrial waste disposal also contribute to pollution in the ocean. The increasing production of plastic packaging and other plastic products is a major contributor to the problem. It has been estimated that at least 50 percent of all visible surface debris is made of plastic. Other materials degrade or sink while undegradable plastic floats in the areas where marine life thrives. Marine debris constitutes a special problem for Galveston Bay due to the shallow, closed nature of the bay. Tourism is affected when recreational boat propellers and intakes are clogged with trash and fishing is inhibited.

Congress has addressed these problems through legislation and the adoption of Annex V of the MARPOL 73/78 Convention. In 1987, the Senate approved Annex V, entitled Regulations for Prevention of Pollution by Garbage from Ships. This international

agreement prohibits disposal into the sea of all plastics including synthetic ropes, synthetic fishing nets and plastic garbage bags. The **Marine Plastic Pollution Research and Control Act of 1987** implements Annex V and amends the 1980 Act to Prevent Pollution from Ships. Under the 1987 law, EPA is responsible for regulations prohibiting the discharge of all plastics into the sea as well as food wastes and other garbage within specified distances from the land. This ban applies to any nation in the 200 mile Exclusive Economic Zone under U.S. jurisdiction. This ban excludes the accidental loss of synthetic fishing nets and repair materials if "reasonable precautions" have been taken.

The Coast Guard is responsible for enforcing Annex V to the MARPOL Convention and accomplishes this through routine boardings of boats scheduled for entry into U.S. ports. It is, however, very difficult to catch a ship that dumps garbage in the middle of the night. The Degradable Plastic Ring Carrier Act of 1988 requires all plastic ring carriers to be made of naturally degradable plastic. However, these and the other antidumping laws discussed above are even more difficult to enforce because there are so many ships and other potential polluters. One of the most effective mechanisms for reducing marine debris would be gradual elimination of those items that cause the most problems. This approach would require federal and state legislation offering incentives to recycle, dispose properly of wastes, and substitute degradable materials for nondegradable ones. One existing federal law, the **Toxic Substances Control Act**, which may be used to limit production of new plastics if it is found that they endanger the health of the environment because they are nondegradable, might be used to control marine debris.

In addition to plastic containers and similar debris, ships generate vast quantities of organic garbage which is routinely dumped at sea or illegally in port. In relatively shallow areas or areas with poor circulation, this garbage may alter the biological balance and attract inappropriate scavengers as well as presenting a potential public health problem. Galveston Bay's four ports may well experience dumping. Ships may also dump parts of their cargoes and, more likely, dirty water from washing their holds.

Several laws prevent such dumping. The Refuse Act of 1899 prohibits the disposal of garbage into U.S. navigable waters, including the territorial sea. The Marine Protection, Research and Sanctuaries Act of 1972 prohibits all unpermitted dumping by U.S. vessels and in the U.S. jurisdictional waters. This act, which excludes dumping of the Corps of Engineers permitted dredged materials and EPA permitted dumping (see below on dredging/filling), is also enforced by the Coast Guard. The Deepwater Port Act of 1974 regulates deepwater port loading and unloading of materials and evaluates any environmental effects. The corresponding state law, the Texas Deepwater Port Procedures Act, gives the governor the authority to determine the approval of applications for deep water ports. The Commissioner of the General Land Office is charged with administering the law to ensure that deep water ports on the Texas Gulf Coast are in compliance with state and local laws relating to environmental protection, land and water use, and coastal zone management.

The Port and Tanker Safety Act of 1978 was passed in order to reduce cargo loss and damage to life, property and the marine environment. The Water Resources Act of 1986 restricts and regulates ocean dumping. The Ocean Dumping Ban Act of 1988 prohibits the dumping of municipal sewage sludge and medical wastes into the sea after December 31, 1991. The Act also provides for a monitoring program to be created by EPA and **NOAA** to track municipal sewage sludge dumping until December 31, 1991. The Shore Protection Act of 1988 requires vessels to install handling systems and obtain permits from the Secretary of Transportation for the transportation of non-hazardous commercial waste.

In addition, the **U.S. Department of Agriculture** prohibits foreign ships from disposing of garbage in ports unless it has been burned or steam-sterilized to prevent the introduction of insects or disease. Unfortunately, few ships have the equipment to meet the standards or the money to pay for expensive waste disposal, and few ports have the USDA approved facilities for waste disposal. Therefore, most of the waste is probably being dumped at sea.

Texas also plays a part in regulating marine pollution. The **General Land Office** has revised its regulations and its lease contracts governing submerged lands off the coast to prohibit discharges of solid wastes from oil and gas drilling and production platforms and from seismic vessels operating in state waters. Oil and gas operators in state waters are asked to present detailed solid waste management plans including descriptions of collecting, storing, transporting and disposing of trash generated on platforms and supply vessels. Violation of the management plans may result in cancellation of leases or operating permits. Inspectors from the General Land Office routinely inspect offshore operations to insure that no solid waste is being dumped from oil and gas platforms or seismic or supply vessels. GLO implements an Adopt-A-Beach program which organizes volunteers for local beach cleanup purposes. GLO also organizes annual trips to pick up and record trash found along the entire Texas shoreline.

Efforts to prevent spills, especially oil spills, and to minimize their effects have increased in the last two years. However, a spill remains an emergency, which means that there is always the possibility that planning efforts will not be as successful as hoped. Dumping, as the very word suggests, is a more informal activity, often simply illegal, and as such it is very difficult to regulate.

DREDGING/FILLING

The presence of so many large industries and cities seeking to maintain or increase their commercial activity creates constant pressure for additional dredging and filling in Galveston Bay and concomitant disposal of resulting material. Myriad small projects, such as individuals building marinas, exacerbate the problem. Disposal of dredge and fill material has important consequences for water quality, because it can add to the suspended solids by stirring up contaminants previously trapped in the sediment, may alter circulation and salinity patterns of the water, and may affect benthic communities. In wetlands, dredge and fill may respectively remove or smother plant and animal communities or alter local

hydrology, although the material may also be used in positive ways to create wetland marsh areas.

Section 404 of the **Clean Water Act** establishes a regulatory framework for the disposal of dredge and fill materials jointly administered by the **Corps of Engineers** and **EPA**. The Section 404 program has a controversial history, and court and policy decisions have altered the balance between its two purposes: it is both a water quality law and a wetlands protection law. As a water quality law, Section 404 gives EPA authority to designate disposal sites and veto proposed ones if they will adversely affect water quality. It operates in conjunction with Section 401, which requires applicants for federal permits to obtain state certification that proposed discharges will not violate state water quality standards. In Texas, the **Texas Water Commission** is responsible for such certification.

The present interpretation of Section 404 emphasizes its ability to protect wetlands. Any kind of work proposed to be conducted in the navigable waters of the United States requires a permit from the Army Corps of Engineers under Section 10 of the **Rivers and Harbors Act of 1899** (RHA). The Corps also regulates disposal of dredge and fill material in virtually all U.S. waters and associated wetlands under section 404 of the Clean Water Act. The permitting processes for the two programs resemble one another very closely and are often conducted jointly for those activities requiring both permits (for example, an activity may involve dredging under the RHA, and the disposal of such material under the CWA). However, because of its broader scope, the RHA offers much greater opportunity to control environmental effects of any construction or other activity in Galveston Bay.

The section 404 process calls for the Army Corps of Engineers first to determine whether a permit is required. This enables the Corps to determine whether the affected area contains wetlands. To qualify as a wetland, an area must have hydric soil, wetlands hydrology, and wetlands vegetation. If the area is determined to be a wetland, the interested party must file an application with the Corps. In the case of Galveston Bay, the application is filed at the Galveston District Office of the Corps.

The District Office holds bi-weekly joint processing meetings which enable those agencies with review authority to consult amongst themselves and with the applicant to address areas of concern entailed in the application. EPA has the authority to review the application to ensure that disposal will comply with its regulations and can veto power a permit it believes will adversely affect the environment. Under the Fish and Wildlife Coordination Act, the **U.S. Fish and Wildlife Service**, the **National Marine Fisheries Service**, and the **Texas Parks and Wildlife Department** are also entitled to comment on the application. The Texas Water Commission, deriving its authority from Section 401 of the Clean Water Act, is entitled to comment on the permit application and must certify that it will not violate state water quality standards. The Texas Antiquities Committee and the State Historic Preservation Officer have the authority to comment on activities which may affect historic properties or artifacts pursuant to the National Historic Preservation Act. The **General Land Office** also reviews the application to determine if an easement authorization may be required for work

on submerged state-owned lands.

After this review, applications are available for public comment, and a public hearing may be held if there is sufficient interest. This public review phase provides additional oversight as the Corps cannot issue permits for activities which the Corps determines to be contrary to the public interest [33 CFR 320.4(a)]. As part of its public interest review, the Corps attempts to determine whether a project could be relocated or whether it is dependent upon the wetlands site. Upon completion of this review process, the Corps may issue or deny a permit for the proposed activity.

In addition to individual permits, the Corps may also authorize activities through letters of permission or general permits. Letters of permission may be granted when the District Engineer determines that the proposed work would be minor, would not have significant individual or cumulative impacts, and is not likely to encounter appreciable opposition. In such situations, the relevant agencies are notified along with the property owners likely to be affected by the activity. Letters of permission are exempt from individual public notice requirements.

The Corps' regulations presently contain twenty-six general permits. Activities falling under these general categories do not require additional permits. For example, a nationwide permit allows discharge of dredge and fill materials into lakes less than 10 acres, including adjacent wetlands. General permits are intended to cover activities that have been found to have no short- or long-term deleterious effects in the affected region. Critics believe that all activities should be considered on a case-by-case basis.

The Galveston District Office processes approximately 800 permits annually for the Texas coastal region (U.S Congress, House, 1989, p. 702). Permit fees are currently $100 for commercial projects and $10 for noncommercial projects. No permit fee is required if the application is withdrawn or denied [33 CFR 325.1(f)]. The Corps has recently proposed increasing fees to $2,000 and $500 for commercial and noncommercial projects respectively (Zinn, June 11, 1990).

In February 1990, the Corps and EPA signed a memorandum of agreement concerning the permit review process. The MOA establishes an agreed upon sequence of mitigation efforts necessary to demonstrate compliance with the guidelines for the discharge of dredge and fill materials provided in Section 404(b)(1) of the CWA. Generally, the Corps must determine that the impacts of the project have been avoided to the maximum extent possible, then unavoidable impacts must be mitigated to the extent practicable and appropriate, and compensation for unavoidable impacts must be pursued (through the restoration of existing degraded wetlands or the creation of man-made wetlands). The MOA further states that mitigation is to be made on a one-for-one functional basis (in the absence of a determination of the functional value of a wetland, a minimum of a one acre for one acre replacement may be used). The Corps and EPA may deviate from this procedure if the discharge can be expected to produce an environmental gain, or if the discharge would result in an agreed

upon insignificant environmental loss. Although the MOA does not alter the regulatory structure of the 404 program, it reflects a continuing trend of cooperation in the administration of the program which should provide for a more consistent application of the program's guidelines (U.S. Congress, House, 1990 pp. 38-43).

Enforcement concerning noncomplying activities may take the form of letters notifying the responsible party of a violation, written orders requiring compliance, or referral of the case to the U.S. Attorney's office. The Corps and the EPA recently signed an additional MOA clarifying each agency's responsibilities concerning the enforcement of Section 404 violations. Generally, the Corps focuses on permit noncompliance, while EPA directs its attention to unauthorized fill activities for which permits have not been granted (Howe, p.3).

The Army Corps of Engineers is also responsible for many federal dredging projects, which are not covered by Section 404. Among the most important of these ongoing projects in the Galveston Bay area are the Houston Ship Channel,
the Gulf Intracoastal Waterway, and the several ports. The environmental impacts of federal dredging projects are assessed under NEPA, which requires an Environmental Assessment (EA). If the EA shows that the project will have a significant environmental impact, a full Environmental Impact Statement (EIS) is required. EISs must be made available for public comment. Most of the channels in the Bay have been in existence for many decades, and maintenance dredging does not require a new environmental assessment. If a project entails a new disposal site, however, it will entail a new assessment. The Corps makes available to all relevant federal and state agencies a list of maintenance projects proposed for the year.

The Texas Department of Highways and Public Transportation (often called T-DOT for Texas Department of Transportation) is the local sponsor for the Gulf Intracoastal Waterway, which must be regularly dredged to maintain its desired dimensions. As the local sponsor, T-DOT is responsible for finding and maintaining areas for disposal of material generated by routine dredging of the GIWW, which is otherwise considered a federal project. T-DOT is also responsible for designing state highways so as to minimize impact upon wetlands; the agency must obtain section 404 permits if their projects will require any dredging or filling. In the last several years, only one highway project in the 5-county area around Galveston Bay has affected wetlands.

Under state law, Texas owns all the state's submerged lands up to mean high tide. These lands are managed by the General Land Office, which can grant easements and leases for their use. A state permit is required for dredge and fill on state land. Applications undergo an environmental review; if approved by the School Land Board, which is the decision-making authority, the applicant is assessed certain prescribed fees. In the 1991 session, the Texas Legislature approved stronger penalties for those who dredge or fill without or in violation of their permits, allowing the state to assess costs of litigation and remediation. Finally, Texas Parks and Wildlife Department regulates removal of sand, shell, and gravel. In the past, old oyster shells were mined for use on roads, and removal was taxed.

Because mining threatened live beds and created turbidity, it was banned. Several sites in Galveston Bay continue to be mined for sand, which is used to restore beaches. Under Texas law, the Parks and Wildlife Department manages and protects marl and sand within tidewaters and on public lands. Those seeking to remove sand must obtain a permit and pay a fee based on the quantity removed. However, navigation, activity covered by an oil or gas lease, and, according to an Attorney General's ruling, land leased by GLO for any purpose, are exempted from this permit process.

Authorization for many of the provisions of the Clean Water Act expired at the end of Fiscal Year 1991 (September 30). The reauthorization process has focused a great deal of attention on the provisions of Section 404 of the Act. Several legislative proposals which would modify the 404 program have been introduced in the 102nd Congress:

H.R. 404 (Hammerschmidt): Under this bill, EPA would maintain an advisory role, but would lose its veto power. The bill makes a distinction between "limited" and "high value" wetlands. Activities on "limited" value wetlands would not require a permit.

H.R. 1330 (Hayes): Under this bill, EPA would lose its veto power, and EPA and all other federal agencies would lose their advisory roles (providing the Corps with exclusive permitting power). The bill would also classify wetlands in a three tier structure according to"value."

H.R. 2400 (Thomas): This bill would essentially maintain the present administrative structure of the permitting process, but would subject the process to more stringent time constraints. The bill does not create a wetlands classification system.

All three of the bills propose changes in the federal manual delineating wetlands. (Zinn, June 6, 1991) All three are clearly intended to weaken the permit process and expedite dredge and fill operations. These changes would exacerbate the limitations already inherent in the process: Many activities including farming are exempted from review; the Corps may issue general permits covering a state, region, or even the nation for activities it determines to be similar in nature and minimal in environmental impact, thus exempting many minor projects from review; and monitoring of permit compliance is minimal due to lack of staff and budget constraints. Recent proposed changes in the definition of wetlands are discussed below under habitat protection.

FRESHWATER INFLOW

Fresh water inflows not only modify the salinity of Galveston Bay, but also provide nutrient and sediment loads necessary to maintain the bay's ecosystem. The amount of fresh water inflow is determined by the water rights permit system administered by the **Texas Water Commission**.

Section 11.021 of the Texas Water Code stipulates that the water of the ordinary flow,

underflow and tides of every river, natural stream, bay, or arm of the Gulf of Mexico in the state is the property of the state. Parties interested in obtaining a right to divert water must petition TWC, which manages an administrative permit system. Water rights may only be granted if water is available at the point of proposed diversion and the proposed diversion will be for a "beneficial use."

Parties likely to be affected by the proposed diversion are notified and may file protests with TWC. If protests are filed, the application must go through an administrative hearing before the Office of Hearings Examiners. Formal recommendations concerning the permit are then made to the Commission which may issue or deny the permit. Permits may be regular ("in perpetuity"), seasonal, or temporary. Although the water in the Trinity River, which flows into Galveston Bay, has been almost completely appropriated, term permits may be granted for water which is not presently being put to use. Permits for large diverters such as municipalities often include rights to water necessary for future expansion. Thus, term permits may be granted in the intervening period until the parties require the water they have been appropriated.

Section 11.023 of the Water Code lists purposes for which water may be diverted. Bays and estuaries are specifically listed only as waters available for diversion. Preferences for uses of water diverted from streams are stipulated in Section 11.024: allocation is to occur according to the ordered preferences. Bays and estuaries are not specifically listed as a preferred use, but qualify under the eighth and final category of "other beneficial uses."

Section 11.147 of the Water Code requires that the effects of each proposed diversion on bays and estuaries be identified. For proposed diversions within 200 river miles of the coast, TWC must include in the permit those conditions considered necessary to maintain beneficial flows to the affected bay and estuary system. Generally, the Commission makes a determination of the amount of water to be consumed by the proposed diversion and considers the effects of such use on the total volume of return flows. Specific requirements for return flows may then be mandated in the permit.

In setting conditions for permits for diversions, TWC must take into account research conducted according to sections 16.058 and 11.1491 of the Water Code, which direct the **Texas Parks and Wildlife Department** (TPWD) and the **Texas Water Development Board** (TWDB) to conduct joint studies to determine the inflow conditions necessary to support the bays and estuaries in the state. A joint report, to be published shortly, employs a mathematical model targeting seven species to determine a range of inflow requirements for sustaining, maintaining, or enhancing harvests. The study will focus on the San Antonio Bay, but will likely be applied to the remaining major estuaries in the state. The study will be used at the discretion of the Texas Water Commission in determining the needs of bays and estuaries in the water rights permit process and may be used by the TPWD as a tool to establish management goals.

TWC must also consider the effects of diversions on fish and wildlife habitats for permit

applications proposing a diversion in excess of 5,000 acre feet per year (Water Code, §11.152). TWC is also required to submit a copy of such a permit application to TPWD. TPWD has the authority to comment on proposed diversions, and these comments must be considered by the TWC.

Potential problems with the existing process for maintaining freshwater inflow are indicated by the fact that maintenance of bays and estuaries falls into the lowest priority category of "beneficial uses." Moreover, permit conditions concerning beneficial flows to bays and estuaries may be suspended during emergencies upon notification of TPWD (Water Code §11.148). Since the primary condition under which a permit would be suspended is a drought, bays and estuaries are at double risk: first from the drought itself, and second from diversion of additional water to upstream cities.

This approach to setting priorities for water use is made still more problematic for regulating freshwater inflow by the number of different agencies that may construct surface water impoundments, primarily for drinking water for the growing population of the Galveston Bay region. Both the Trinity and the San Jacinto River Authorities, whose charge is to develop fully the water resources of their respective watersheds, operate surface water impoundments and propose additional ones. Lake Livingston, which supplies water to the City of Houston, is managed by the **Trinity River Authority** (TRA). The TRA, together with the city of Houston and the Chambers-Libery Counties Navigation District, is the sponsor of the proposed Wallisville Project, a dam at the lower end of the Trinity River that will prevent saltwater intrusion and supplement Houston's water supply. The **San Jacinto River Authority**, along with the Bureau of Reclamation, proposed a new reservoir on Lower Lake Creed, a tributary of the San Jacinto River, to serve as water supply for The Woodlands; although an EIS has been submitted to EPA, the project is not being considered because of the absence of adequate local funding. Finally, the **Texas Water Development Board** makes loans to communities for reservoirs for water supplies through the Water Development Fund; the Tenessee Colony project in the Trinity Basin is described as a possible new project in the TWDB's 1990 state water plan.

Perhaps more important, TPWD may not veto permits although it may review them. Thus concerns about habitat and species protection only affect permit decisions if TWC agrees. Because the data are generally lacking to show that bays and estuaries and the associated living creatures require a certain amount of freshwater inflow, while the data are readily available to illustrate the amount of water that cities will require, the process is generally biased against the needs of the estuaries.